March 1993

approach

The Naval Aviation Safety Review

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Are You Perfect?

All aviators should ask themselves this question: Am I perfect? If the answer is no, then you should never stretch a rule, guideline or limit. Because if you do it long enough, one day it will get you.

One bright, sunny day in the desert, an F/A-18 driver is scheduled for a good-deal low-level through a familiar canyon.

The fighter rolls inverted and dives for the deck as the pilot guides it toward the canyon. Although he is 12 miles from the entry point, he wants to fly down a canyon just prior to the low-level.

He has flown this route before, but on this beautiful morning he is going to fly it faster, lower and closer than he has ever flown it before. The SOP says single aircraft shall fly no lower than 1,000 feet on a published low-level route.

The jet swoops down to 500 feet, then 200, then 150. The walls of the canyon rise on each side, intensifying the sensation of speed. Up ahead a dog-leg to the left will lead him into the morning sun.

The pilot banks into the turn. The ground rises to meet him as he increases the pull. The G forces increase: 3, 4, then quickly 5, then 7Gs. He pulls the nose up as the altitude warning buzzes in his ear.

He is now looking into the sun. The glare obscures the rocky ridge in front of him. He senses that the ground is close so he increases his pull. The jet is climbing. He will not clear the ridge.

The 40,000 pounds of aluminum, carbon fibers, steel and fuel are reduced to shrapnel and a fireball. He never tried to eject. Time did not allow it.

Two lines are important from the report on the above mishap.

First, "He was characterized as an aggressive and tactically oriented pilot who adhered to ROE, complete briefings, flight conduct and thorough debriefings."

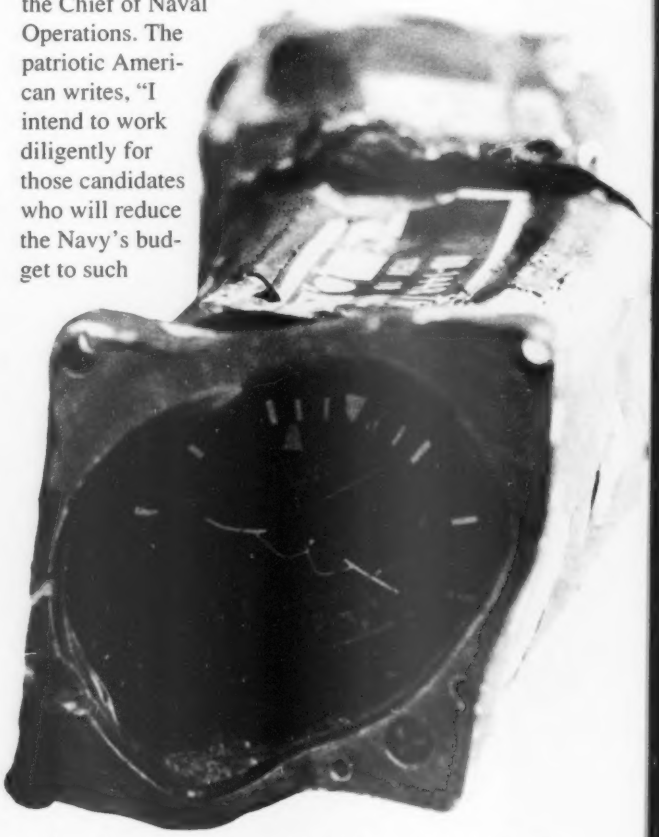
Later, the findings said, "He had been known to have flown up the canyon at low altitude heading toward point alpha several times in the past."

These two statements are inconsistent.

On another warm summer afternoon, two aviators spot a lonely pickup truck rolling down an empty highway. A quick discussion, a flick of the stick and they're headed for the deck. A little impromptu airpower demonstration for a patriotic American.

Inside the truck, the thunder of the passing jet causes the driver shortness of breath and a scare he won't soon forget.

Several weeks later a letter shows up on the desk of the Chief of Naval Operations. The patriotic American writes, "I intend to work diligently for those candidates who will reduce the Navy's budget to such minimal levels that there will not be enough money to finance that sort of reckless behavior."



Why put lives, careers, equipment and money on the line for a few yuks? The world is changing. The Navy isn't a bunch of good-ol'-boys shooting up the bad guys and barnstorming across the country. Irresponsible acts become tomorrow's headlines – stop putting the Navy on report.

Lt. Steve Halsted

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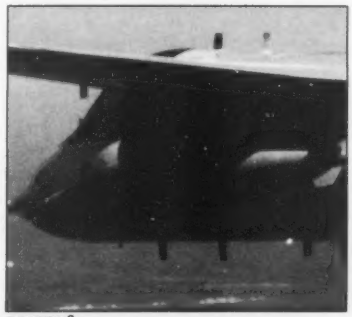

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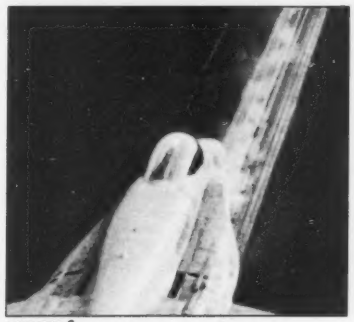

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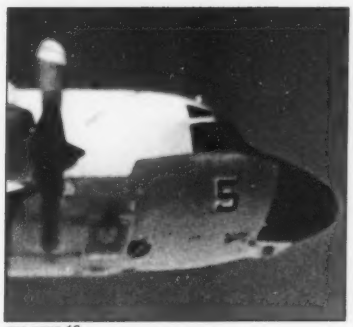

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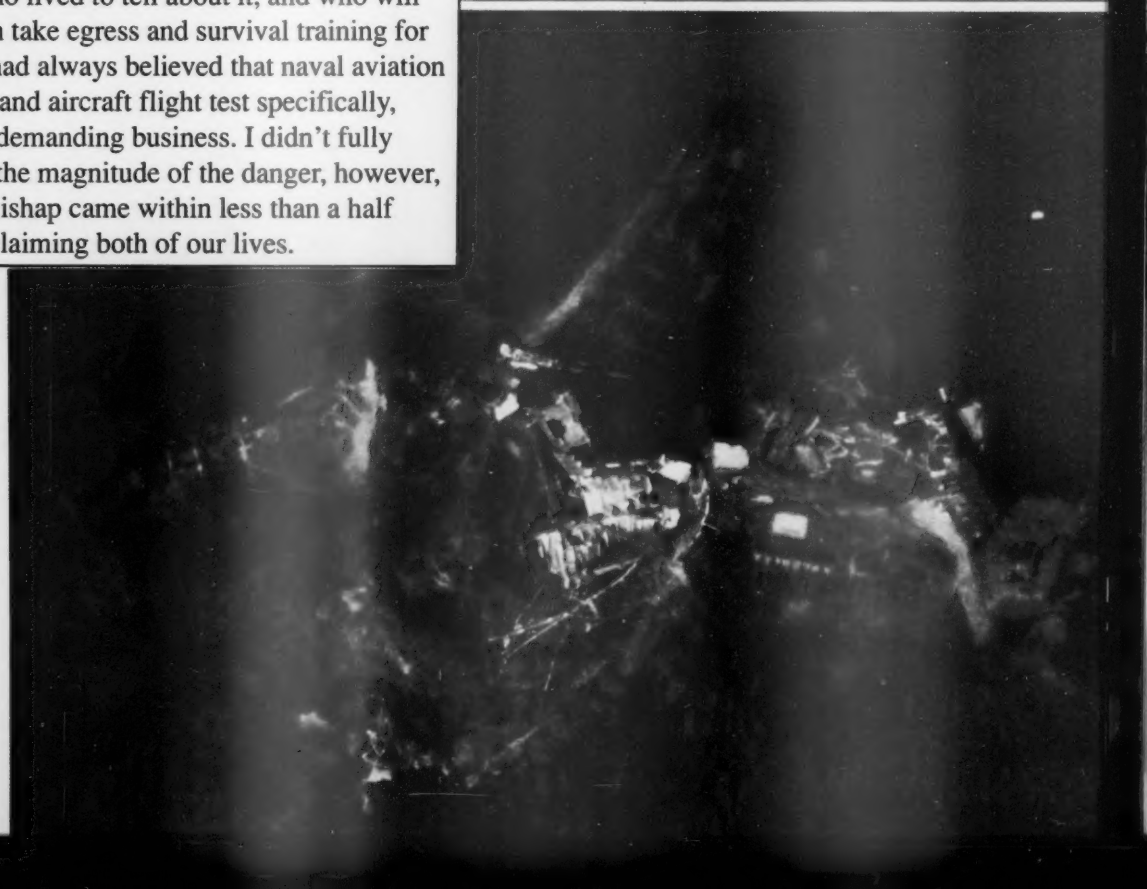
Disaster over the Bay

By LCdr. Steven R. Eastburg

Our S-3A broke apart in midair, littering the Chesapeake Bay with thousands of pieces. My pilot and I are two very fortunate aviators who lived to tell about it, and who will never again take egress and survival training for granted. I had always believed that naval aviation in general, and aircraft flight test specifically, could be a demanding business. I didn't fully appreciate the magnitude of the danger, however, until this mishap came within less than a half second of claiming both of our lives.



I was excited about flying the hop. I had heard a lot about this particular test program, which gathered data to enhance the fidelity of the operational flight trainer (OFT) control laws. The idea was to measure several flight parameters while subjecting the airplane to a variety of flight conditions. The previous flights had reportedly been "highly dynamic"— real "E" ticket rides.

I felt comfortable with our preflight preparation. We had been thoroughly briefed by our engineers and we had both reviewed the test plan and data cards. The pilot also had a session in the trainer to practice the specialized maneuvers required to generate the unusual flight conditions. (We only fly with two men in the front on certain high-risk flights.) The fact that 93 different flight parameters would be continuously telemetered to the engineers on the ground gave me an extra measure of confidence that there would be others helping us stay out of trouble.

Once we got into the test maneuvers, however, we found ourselves thrown about the cockpit as the sinusoidal stick-and-rudder sweeps of increasing amplitude and frequency called for in the test plan sent the airplane into highly exaggerated pitch, yaw and roll maneuvers.

We were at 5,000 feet and 365 KIAS heading southwest through the southern Maryland sky when my worst nightmare came true. I heard a thunderous "Crack!" from the aft section of plane. I knew instantly that we were in trouble. I quickly checked around the cockpit in a vain attempt to figure out what had failed. At about the same time, the airplane pitched over, an uncontrollable 100 degrees-per-second left roll and an enormous left yaw.

The crack I heard was the loss of our vertical tail and a portion of our horizontal stabilizer. About a second after we lost these critical surfaces, the plane pitched up, which created eye-watering Gs on the airframe and ripped off the right wing. The loss of the wing opened up a fuel cell, atomized the JP-5 and caused an enormous fireball. At the same time, what remained of the fuselage structure tumbled through the air and broke apart.

At the first indication that something was wrong, I jerked my hand toward the lower ejection handle. Our bodies were severely out of position. The pilot was turned to his left, stick and throttles still in his hands, and doing everything in his power to control what remained of the airplane. We were hanging in the lap straps from about four negative Gs, thrust forward from the longitudinal deceleration, and twisted and thrown to the right under the force of over 2.5 lateral Gs. Nevertheless, I realized that we had to get out of this rapidly disintegrating airplane *now*.

My last thought as I frantically jerked the handle upward was, "Man, this is going to hurt us both!"

As my hands were in the middle of their upward motion, I heard my pilot, who also recognized the severity of our situation, scream, "Eject!"

The incredible speed at which these events occurred is perhaps best conveyed by the timeline provided by telemetry:

15:17:36.57—Vertical and horizontal tails failed and departed aircraft

15:17:37.08—Approximately -4 normal Gs

15:17:37.42—22 degrees left yaw, greater than 2.1 lateral Gs

15:17:37.49—100 deg/sec left roll

15:17:37.52—COTAC pulls ejection handle; 20 degrees nose down, 15 degrees left wing down, over 25 degrees left yaw, -1.5 normal Gs, over 2.5 lateral Gs

15:17:38.00—Greater than +4 normal Gs

15:17:38.34—Starboard wing departed aircraft, seats departed aircraft

15:17:38.36—OAT gauge reports temperature exceeds 100 degrees C (fireball)

It seemed to take an eternity for the seats to fire. Even in those brief microseconds, I recall attempting to brainstorm alternative forms of egress, quickly realizing that if the lower handle didn't function, little time would be left to try the upper one.

It is fortunate that our Escapac seats were up to snuff that day for, as the telemetry shows, we only had another couple hundredths of a second to get out before we would die. I still marvel we are alive when I review this sequence, including the fact that while we had escaped by only the slimmest of margins, I had pulled the handle only 0.95 seconds (considering the 0.82-second delay time for the front seat) after the first indication of trouble—the loss of the tail!

Later, outside observers told us that they saw the spectacular fireball erupt and couldn't believe it when, just a split-second later, they saw our two chutes blossom, seemingly just above the inferno.

The next thing I remembered was hearing the opening "pop" of my parachute and looking overhead. I was relieved to see a full canopy. After looking down to confirm that I still had all of my appendages, I tried to find my pilot. It was immediately comforting to see him floating down to earth at about my altitude. I gave him a big thumbs-up, but didn't see any acknowledgement.

I was concerned, but thought that perhaps he hadn't seen me yet. Strangely, the next thought I had was that I better call my wife and tell her that I would be late for

dinner! It was an incredibly strange feeling to find myself floating down to earth along with pieces of the fuselage. I looked down at the water just in time to see what appeared to be a major piece of the fuselage hit the water with a huge splash.

After taking a few moments to regain my senses, I remembered IROK and immediately went to work on my survival-equipment housekeeping chores. I am glad I had this training drilled into my head, for I probably would have forgotten it amidst all of the violence and confusion of the previous seconds.

The procedures and hardware worked as advertised. I recalled something that I always told myself I would do if I had to eject and had time; I would try to get a mayday call out while I still had a relatively long communications horizon.

In the S-3 community we frequently work independently at long distances from the carrier and land, and I always thought that this would enhance my chances of being found. I found it relatively easy to fish the PRC-90 out of my vest and was able to get several calls out on 243.0 MHz and 282.8 MHz before getting close to the water.

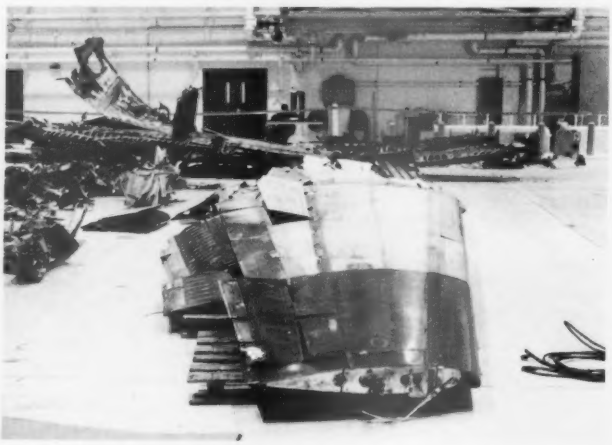
While descending, I tried to steer my chute toward Bloodsworth Island, a small marshy land mass about one mile west from where we jumped out. I did not have much luck, because I hadn't fully actuated the four-line release. I realized later that it probably would not have been a good idea to land in the swampy marsh anyway, as it would have greatly slowed the recovery time. More importantly, I learned later that two A-10s had been dropping Mk-82s, only moments before our ejection, on the very spot on the island on which I was attempting to land.

As I hit the water, I immediately pulled down on the lower koch fittings, and again just as advertised, the chute gently floated away from my position, sparing me the hassle and danger of entanglement. I quickly climbed into the raft, and it was then that I realized how long it had been since I had reviewed the locations of the survival and signaling equipment in my SV-2. I was incredibly fortunate to have ejected under the best of conditions—sunny afternoon, relatively close to land, multiple potential rescuers not far away, and in decent physical condition, save for a few hefty lacerations and other bruises.

I wondered later what I would have done if we had ejected far out to sea in the middle of winter and with severe injuries. At the same time, I was also wondering where my pilot was, what his condition was and how I might get to him.

Fortunately, I did not have time to do much more than to get several more radio calls out before I spotted a small boat coming over the horizon and speeding directly toward me. Within eight minutes of landing in the water, I was in a boat from the Maryland Department of Natural Resources (DNR) heading for the pilot. When we got to him a few minutes later, we realized that he had not fared nearly as well as I. He had been burned rather severely by my seat's rocket exhaust and appeared unconscious as he floated in the water. The three of us struggled for several minutes before we were able to get him safely aboard and in a comfortable position. At about the same time, a Navy SAR H-3 arrived at the scene and deployed a swimmer. I realized that the pilot was in too bad a condition to be hoisted with either a horse collar or a litter, so I motioned the helo away and asked the DNR officers to quickly take us to Deal Island, only about a 8-10-minute ride.

At the dock, I was relieved to see a variety of ambulance teams, as well as a Maryland State Police Medevac helicopter and the Navy H-3. The Medevac helo took the pilot to a burn treatment center and the H-3 took me back to the Pax River hospital. The entire SAR effort was conducted efficiently and with a minimum of confusion.



The S-3 wreckage laid out for further investigation.

There are, fortunately, very few examples in aviation history of airplanes breaking up in flight simply under aerodynamic loading. Standard operational maneuvers generally will not cause airplanes to come apart. The maneuvers that we were performing were not prohibited by NATOPS, were accepted within the flight test community, and were carefully researched and documented in the test plan. We found out later, however, that the aerodynamic loads these maneuvers put on the tail were approximately 230 percent of its design limit. Investigations have revealed that even rudder rolls at certain airspeeds in the S-3 will cause the loads on the vertical tail to exceed its design limit. The message here is that it is critical to know your airplane and its limits, including those which are not necessarily written in NATOPS. ◄

LCdr. Eastburg is an S-3 NFO assigned to the Force Warfare Aircraft Test Directorate at NAWC Patuxent River. He is a graduate of the U.S. Naval Test Pilot School.

Flying Fashions

By LCdr. Eric Edwards, RN

All aircrew, throughout the course of their flying activities, may suddenly find themselves facing cold water, roaring fire, or fierce windblast. It is for this reason that many years of experience and expensive research have gone into developing Aviation Life Support Systems (ALSS).

The most basic ALSS item, the CWU-27/P - Summer Flyer's Coverall, is probably the least correctly used piece of equipment in the whole inventory. Yet the instructions for its use are spelled out clearly.

•NAVAIR 13-1-6.7 Section 5-7 states that cotton underwear should be worn under the coverall; section 5-13 specifically warns that sleeves should be closed to the wrist.

•NAVAIR 13-1-6.7 Table 4-9 recommends underclothing based on water temperature.

Despite these clearly stated requirements, aircrew continually take chances by ignoring or flouting the rules.

The following are extracts from the aeromedical section of the previous article's mishap report:

✚ The flame was hotter than 800 degrees Fahrenheit (the charring point of Nomex) and intense enough to melt his survival vest and burn through his flight suit and shirt.

✚ The mishap crewman did not wear required anti-exposure aramid underwear. If the SAR effort had been delayed or he couldn't get into his raft, he would have succumbed to hypothermia much faster. Also, if subject had been wearing aramid undergarments, the extent and severity of his burns would have been greatly reduced.

As an aside, the crewman was not wearing gloves, his sleeves were rolled up and his visor was up. If he had followed the rules, he would have been burned on just 26 percent of his body; because of their location, these unnecessary burns will permanently disfigure this aviator after excruciating physical pain has eventually subsided. ◀

LCdr. Edwards is a Royal Navy exchange officer with the Naval Safety Center. He is the head of the Center's Life Support Equipment Branch.

This photograph shows the coverall and t-shirt (50/50 cotton polyester) worn by an aircrew member during a recent multi-seat ejection. He received, among other injuries, second-degree burns over 35 percent of his body.

Repeat Gripes That Bite

By Capt. T.W. McKnight, USMC

I had been in Key West for a week. Not a bad deal, except that I was trying to finish the CQ in the A-4. The weather and fueling problems on *Lexington* had conspired to prolong my agony. I had been overhead the ship five times and still needed two traps.

Today, I was scheduled for an early morning brief, after which I would wait for an overhead time. Today was the last day for the CQ before the ship headed back to Pensacola.

After the brief, I saw that jets had been assigned, so I went to read the aircraft discrepancy book. I saw that my A-4 had flown the day before and that the pilot had made an arrested landing because of an unsafe indication for the right main gear. Maintenance had signed off the grip with "drop checks good, aircraft checks 4.0 on deck," which didn't give me a warm fuzzy. I spent extra time going through the PCL and landing-gear emergencies.

Lex called us with an early overhead, so we walked to our jets in the dark and preflighted with flashlights. I checked the area around the right main very carefully.

When we arrived at the ship, the signal was charlie, and we proceeded into the break. Out of the break, I was calm and confident (relatively speaking, of course) as I scanned the landing gear indicators before my landing checklist. I saw an unsafe indication for the right main gear. I gave the indicator a quick rap to no avail.

I told the Boss and he said to fly up the starboard side. He also instructed the lead safe (a squadron CO with an instructor in the back seat) to join on me and check me out.

"It's unsafe," my new wingman called. "It's not fully extended. Start a dirty bingo profile to Key West and we'll fly on you."

As I climbed, he told me to try raising the gear. The gear came up – what a relief. When we got within range, I called the base. I said this was a repeat gripe. The base read back the book's signoff: "Drop checks good, aircraft 4.0 on deck."

"That's just fine," I muttered, "but I'm in the air!"

We decided to head back to Key West and hold 15 minutes from the field where I would try to drop the gear again. I reread the PCL; I had gotten a good idea of possible remedies earlier that morning, but I figured another review would be worthwhile.

Fifteen minutes from the field, we started a left orbit and followed the steps in NATOPS. Each try brought the

same indications in my cockpit and the same response from my wingman: "Unsafe." When my low-fuel light came on, we decided to give it one last try before heading home.

I put Key West on the nose and was told that all flights on the field were being held on the ground to give us all the airspace we needed.

My det OINC and operations officer were in the loop, and we all agreed that a gear-up, flaps-down landing on the fuel tank was my best option. Then the base called.

"We want you to drop your hook and take a trap."

"Say what?"

"Drop your hook," the controller repeated.

"Yes, sir."

As I approached downwind, the plan came together. An LSO was on station and he wanted me to fly a low, flat practice approach to get the picture. Then he wanted me to bring it around as he talked me into the E-28 gear. I needed to land just far enough past the wire so that the hook would catch the cable. A roll-in engagement might bring the cable over the nose and through the canopy.

Turning off the 180, I finished my landing checklist and scanned my fuel.

The LSO called, "First pass, low, flat practice approach. Second pass, low, flat to a trap."

"Roger," I said. "Be advised, I have 600 pounds of fuel."

My wingman broke the silence as I descended through the 90.

"Take a trap on the first pass," he said.

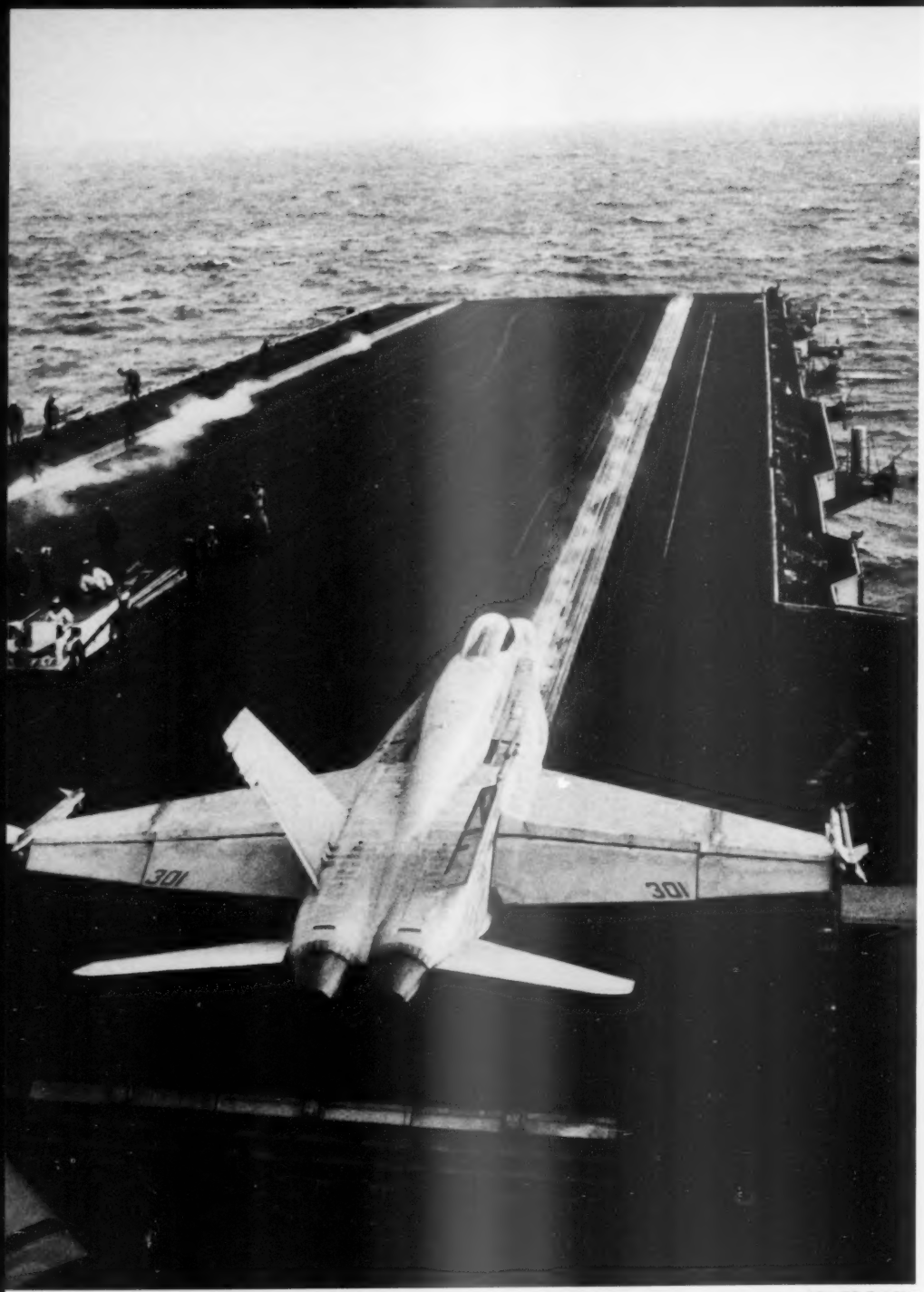
The LSO quickly agreed. On short final, I spotted the E-28 gear. Two seconds later, I had caught the wire and was enjoying a short ride down the runway.

After three hours of debrief, paperwork and medical's fluid sampling, I got a call from the det ops officer. He had talked to the flight surgeon and told me I had a waiver and an overhead at the ship if I was up to it. Within six hours, I had three (OKs) and a "qual."

Since that day, when I stop in maintenance before a flight, I read through each gripe and pay close attention to trends as well as remarks about correction action. Just because a gripe is signed off doesn't mean it won't happen again. Remarks such as "Could not duplicate" or "Checks 4.0 on deck" make the hair on my neck stand up. I was fortunate. Landing gear emergencies are not normally immediate-action emergencies. I had plenty of time to try to fix the problem and to develop a game plan to fit my situation. However, that may not always be the case.

The ADB can give the pilot a good picture of trends for an aircraft or its systems; it also gives the pilot enough of a heads-up to prepare for any repeated discrepancy. ◀

Capt. McKnight flies with VMFA-235.



LCdr. T.B. Surbridge

That wonderful acceleration slowed, and I knew the shot was bad.

The Decision Was Made for Me

By Lt. Steve Thompson

I started my pinky preflight for a night WASEX mission. I was spotted beside the island along with a couple other Hornets. After watching most of the launch aft of cat 1, I was hurriedly taxied aft to cat 4. I thought it was a bit unusual since cat 3 was already being wrapped for the recovery. Following the director's wands, I went through my take-off checks again. Everything looked good. I had no ordnance, so fuel state on the ball would not be a problem.

Pushing the throttles up to mil, I felt the normal squat of the jet. Placing the launch bar switch to retract on signal, I went through the cockpit wipeout, checked that my gauges and DDIs were set. I grasped the canopy bow handle with my right hand and placed my head back against the headrest. Then I turned on the external lights.

I saw the cat officer's wand touch the deck, just before the cat shot slammed me back in my seat. Soon afterward, about halfway down the stroke, I felt a "clunk" below my feet. That wonderful acceleration slowed, and I knew the shot was bad.

I shoved the throttles into max AB trying to get minimum airspeed, but in my mind I knew I wasn't going flying. With the floodlit flight deck creeping past me, I reached down with both hands and pulled the ejection handle. I remember seeing the bright flash as I left the cockpit, and instantly regretted not having my head back and chin elevated as my head was pinned to my chest.

After a tumbling sensation and opening shock, I grasped the risers and turned toward the ship. From my vantage point, I knew I wasn't going to make the flight deck. My only thought was that "This is gonna hurt."

I slammed into the catwalk area on the port side, just forward of the angle. I continued toward the water but my parachute tangled on the flight deck edge and the deck crew scrambled over it. I dangled off the side of the ship for about five minutes, listening to the excited voices above me. They pulled me up to the deck by my chute, strapped me to a litter and took me to medical.

Fortunately, I escaped any neck or back injuries, but I fractured my right leg just below the knee and my heel was crushed into several pieces. I was stabilized in medical that night and evacuated the next day. My ordeal continues with therapy to regain flight status.

The most distinct memory from that cat shot is that when the acceleration slowed, I knew right away I was not going flying. Reviewing the PLAT video, I was surprised to see how much time it took to get out of the aircraft. The entire sequence lasted 10 seconds, with five seconds in the chute. The time to get out was now! I never considered trying to stop the aircraft, since I had 50 knots of airspeed. The decision to eject was made for me.

If I had waited until the end of the stroke to decide to eject, I would not have survived. The jet did not have the airspeed to rotate and fell quickly into the water. There are certain parameters during the cat shot that must be met, determined by aircraft configuration and weight. Make your decision and bet your life on it every time down the track. ◄

Lt. Thompson flies with VFA-192.

Here's a note from the squadron ASO.

As a result of this mishap, our squadron has incorporated a minimum fly-away speed chart for gross weight in our briefing guides. Speeds are presented for a gross weight and engines in mil or max. We also review the ability to emergency jettison our external stores and tanks and reduce our gross weight, thus reducing our minimum fly-away speed.—Ed.

Once in the chocks, the silence was deafening.

By LCdr. Rick Ryan

Flying like a Rock

PH1 (NAC) Bean

"P-3C, say your altitude."

"Passing 5,600."

"P-3C, climb immediately to 6,500. Maintain current heading."

There it was: confirmation that something was terribly wrong with the approach. Doing our best to imitate the flight characteristics of a rock, we had unknowingly flown through a published step-down minimum while ignoring a series of cues that screamed for attention. It was incredible that we let things get so far out of hand considering the chances we had to catch them.

Returning to our det base after a routine operational hop, we were near the end of a three-week deployment. The PPC (at the controls) and I had a total of more than 4,500 flight hours. Both of us were qualified PPCs and instructor pilots. We had been flying together for more than six months. Our coordination seemed excellent, and we often anticipated each other's actions. We were flying with our regular flight engineer, also an instructor. Both the navigator and radar operator were fully qualified and were regular crewmembers.

Feet dry at FL 250, approximately 70 miles from the field, we asked for a lower altitude, anticipating a gradual descent over the mountains between us and the runway.

At 45 miles, with no descent clearance, our inquiries were explained by a terminal-radar malfunction. Passing 38 DME, we were called on top of the initial fix for the HI-TACAN and cleared for the approach. I flipped to the approach plate and glanced at the approach, we accepted the unsolicited clearance and began the chase to get on profile. ATC provided terminal weather—VFR at the field and numerous mixed layers between FL 250 and 3,000 feet.

The approach brief went something like this: "OK, looks like a serious descent profile. I've got the FAC dialed in on TACAN. Back me up on the VOR and verify my step-downs as we go. Gear down, we'll get approach flaps passing 190 knots."

Early gear and flaps would be necessary to fly the required descent angle. I lowered the gear and acknowledged the approach brief, thinking that the last HI-TACAN approach either of us had shot was probably in a T-44.

With the gear down, we went to maneuver flaps and started the checklists. Looking down once again at the approach plate, I verified FAC, field elevation and MAP. I then scanned down the busy profile from our current DME, noting that we would have to lose some 20,000 feet in 30 miles while complying with six or seven step-down minimums. This was not your normal P-3 descent.

Maybe we should have requested a few turns in holding to complete the checklists, configure the aircraft and talk about it while we got down to the published minimum for the IAP (16,000 feet). But it was too late—32 DME—and we were inbound. I then called out the upcoming step-down minimums.

"We're looking for 9,000 feet at 28 DME, and 4,300 feet at 20 DME. That's 4,700 feet in eight miles, about 1,400 fpm at 140 knots once we get on profile." Not too bad, except at 28 DME we were well above the profile. We put the flaps at approach setting.

In and out of clouds at 26 DME, we passed 12,500 feet at more than 3,500 fpm. Shortly afterward, we could see the ground below us. I immediately got the feeling of being on a sleigh ride down a mountain. Not only did we seem close, it felt like we were following the terrain.

I checked the altitude-vs.-profile while looking ahead for any obstructions.

"No room for getting below profile on this one," I commented. "We're still above glidepath and already it feels ugly."

The others agreed and both the PAC and I checked our approach plates as we continued our falling-rock routine.

"Maybe we should knock this off," I thought. "Level at the next IFR altitude and descend in holding over the field. No mountains there. We've got this licked."

Closing on 20 DME, we were passing 5,600 feet and trying to be at 4,300 feet when Approach intervened.

Cleaning up, we received clearance direct to the field, which we eventually saw. Once in the chocks, the silence was deafening.

"Man, talk about screwed up," I thought. "Give me a gun so I can shoot myself." We had misread the descent profile, correlating each step-down fix's minimum altitude to the preceding fix. In other words, the minimum for 28 DME was 16,000 feet instead of 9,000 feet. The minimum for 26 DME was 9,000 feet instead of 5,600 feet, and so on.

As we approached the 20 DME fix, we should have been level at 5,600 feet. Instead, we were passing through it at 1,500 fpm. Fortunately, the aircraft wouldn't cooperate with us as we tried to bust every step-down minimum along the FAC.

Despite our best efforts, we couldn't descend steeply enough. Also, we were fortunate that the terminal controller immediately saw our continued descent at a minimum altitude.

The navigator and radar operator never saw a problem. Afterward, the PPC and I made a trip to base ops to thank the controller and verify what happened. We debriefed the crew, emphasizing coordination and backup. We vowed to never get ourselves in a similar situation again.

Years later and back in the seat again, I now realize that we didn't take the debrief far enough. At least, we should have briefed every crew in the squadron, stressing the following points.

•Never begin an instrument approach—especially an unfamiliar one—without a thorough brief. Cover every intermediate minimum from the MAP out to the IAF with no ambiguity. An important safety tip regarding altitudes displayed on an approach plate: altitudes precede fixes or are arrowed to show where they apply.

• If possible, don't accept an approach clearance that puts you behind the eight ball from the start. Use holding to buy the time you need to brief the procedure and establish the aircraft at a reasonable altitude and configuration.

• Use the simulator to practice every available approach at upcoming detachment sites.

• Listen to your instincts. If something doesn't look or feel right, take the time to check it out. ◄

LCdr. Ryan flies with VP-11.

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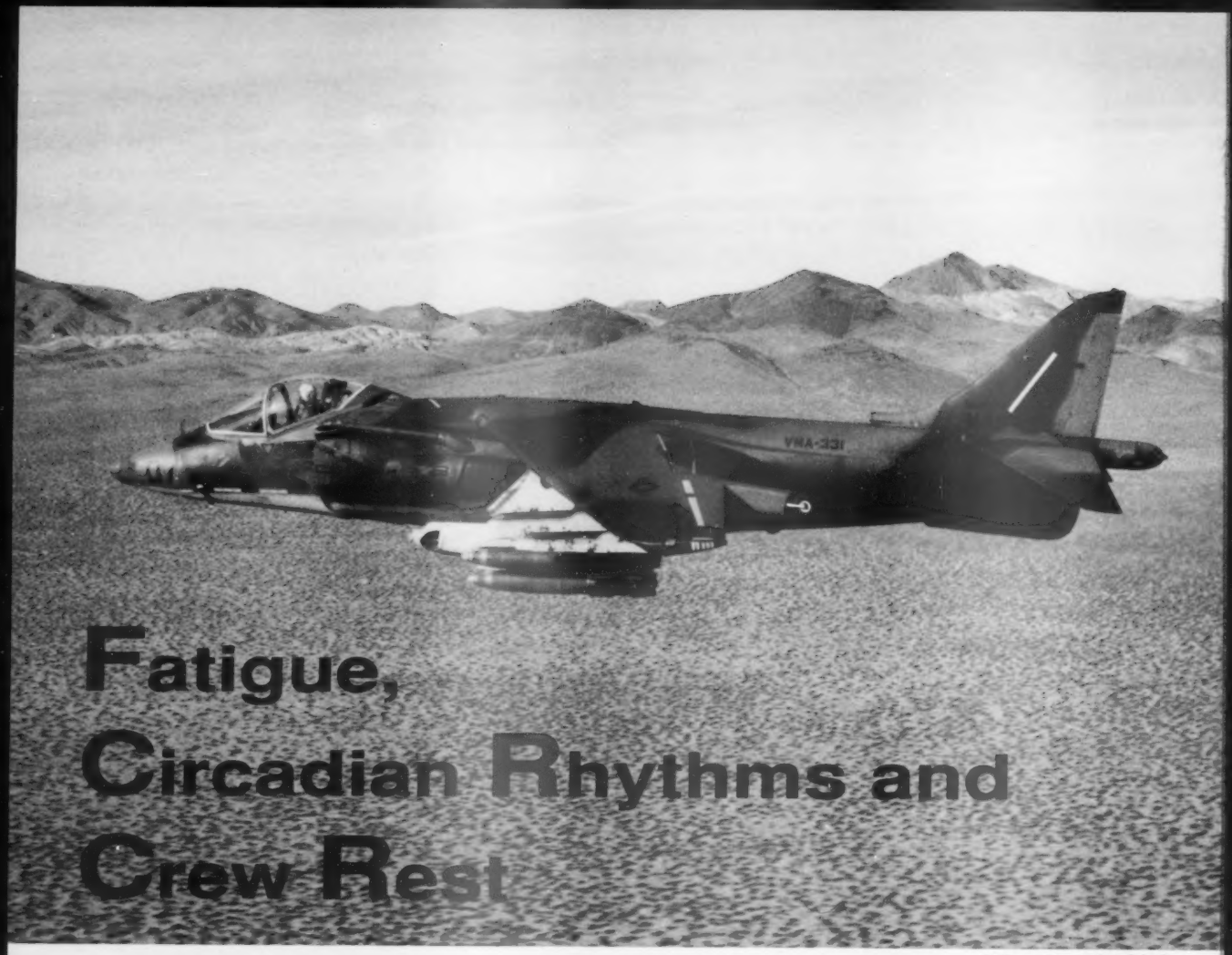


Fatigue, Circadian Rhythms and Crew Rest

McDonnell Douglas Corp. St Louis

By Dr. Robert A. Alkov

A 26-year-old replacement pilot (RP), flying an AV-8B, reported a flap warning light after takeoff. Moments later, his aircraft crashed 1.5 miles from the departure end of the runway; he ejected too late and was killed.

The RP had 324 hours total flight time, 52 hours in type. He was nine months out of the training command, and had finished 85 percent of the FRS syllabus. He was married and had a four-month-old daughter. He had only three hours of restless sleep the night before the mishap flight because the baby was crying all night. He didn't eat breakfast that morning. At the time of the mishap, it had been 15 hours since his last meal. He complained of being tired to his wife and mentioned that he would try to get out of his first flight.

When he got to the squadron, he told the schedules officer that he was tired and had three flights within a 13-hour crew day. Skeds told him he could cancel, but the RP replied that he was afraid he would look like a "wimp." He was told this would not be the case, but that he had to decide if he was too tired to fly. He said he was "fine" and went to his brief. While the RP suited up, a flight-equipment technician noted that the pilot was uncharacteristically surly, slamming lockers and throwing equipment around. After man-up, the final checker saw him staring off into space; the checker had to wave his arms to get the pilot's attention.

At takeoff the RP called his lead and said, "I have a problem with my flaps."

Lead asked, "Is it a red flaps light?"

The RP answered, "Yes".

"What are your flap indications?"

The RP replied, "33, 53."

Lead then asked, "What are your nozzles?" There was no response. After several tries to reach the RP, lead saw a fireball off the end of the runway.

The RP had reduced power to 75 percent when he'd seen the flaps warning light. Preoccupied with investigat-

ing the flaps failure, he hadn't maintained his scan. He evidently had gotten behind the aircraft and hadn't noticed airspeed bleeding off. He also hadn't recognized his increasing angle-of-attack secondary to 75 percent throttle with flaps failed at 59°, until entering the buffet prior to stall.

He selected nozzles aft (0°) instead of full power to regain airspeed before stalling, causing a flap impingement and immediate nose over. (NATOPS states that for a flap failure during takeoff, "Nozzles as required, no further aft than 20° less than flap position.") He applied full-aft stick to try to recover.

Moving the nozzles to 39° or more and applying full power may have allowed recovery. Although the simulator syllabus requires this emergency to be demonstrated before solo, there was no documentation that he had this training.

This Harrier pilot may have been distracted by the flaps-warning light while in a high workload segment of flight. His scan broke down, causing him to fail to notice an approaching stall. He was tired and hungry, possibly hypoglycemic.

❑ Fatigue and Flight Mishaps

Naval Safety Center statisticians found that during CY 77-CY 90, 12.2 percent of Class A flight mishaps occurred when the crewmember(s) were tired, had less than four hours sleep in the 24 hours before the mishap, or who had been awake continuously for 20 or more hours. General NATOPS (OPNAVINST 3710) requires aircrew to get eight hours of uninterrupted rest every 24 hours. Pilots working 10 or more hours in the 24 hours before a mishap were also more likely to be at fault in the mishap than those who worked less than this.

Naval Safety Center statistics show that the highest Class A rate for helicopters occurs from 2100-0600. For all aircraft combined, the highest probability of having a flight mishap occurs from 1800-2400.

❑ Fatigue and Crew Rest

There are two basic kinds of fatigue: acute and chronic.

- Acute fatigue is caused by too much physical or mental activity. It is the most common kind of fatigue and includes task-induced (operational) fatigue. Acute fatigue can be relieved by a good night's sleep.
- Chronic fatigue is caused by long exposure to stress. Its symptoms include insomnia and forgetfulness. Chronic fatigue is not easily overcome. Therefore, measures to prevent it must be employed before these symptoms appear.

❑ Causes

The causes of fatigue can be categorized in six groups: **life stresses** (family, financial, interpersonal or job-related), **behavioral** (inadequate crew rest, lack of sleep, missed meals), **physical** (excessive or prolonged muscular activity), **cognitive** (as in mental overload), **environmental** (noise, vibration, motion, temperature/humidity extremes, hypoxia ozone levels, G-forces), and **physiological** (illness, hangover, disturbed or displaced biological rhythms that occur during flights that cross several time zones). Research has shown that sleep disruption and irregular scheduling have greater impact on aircrew performance than long work days.

❑ Symptoms

As the effects of fatigue accumulate, the pilot's visual field narrows. Tenseness and restlessness are common. Complaints of cramps or stiff, sore muscles may increase. Symptoms may include, headaches, heartburn, constipation, diarrhea, shortness of breath and vague chest pains. The individual becomes irritable, impatient, grouchy and exhibits fault-finding behavior and temper flare-ups. There is an increased reliance on caffeine or alcohol with changes in sleep habits or nightmares, which add to the fatigue. Depression sets in, followed by anxiety, fearfulness, confusion, a sense of failure and withdrawal.

❑ Performance Effects

Simulator studies of pilot fatigue have shown that there is a disintegration of skilled performance, which leads to a loss in overall capability to manage a complex task. More attention is spent on individual task components to the exclusion of others, with a tendency to neglect cues. Peripheral activities, such as checking fuel, are frequently overlooked. Reduced attention span also often results in the breakdown of a pilot's instrument scan. There is a tendency to pay undue attention to one or two instruments, neglecting the rest. The pilot's reaction time is increased. He misses radio calls, and accepts lower standards, carelessness and sloppiness. He makes mistakes on very simple, familiar tasks and blames other aircrew members or the aircraft for the problem. Responses become non-objective and unreliable.

If you are tired, sick or not physically or mentally prepared to fly, it is your responsibility to cancel your flight. Unfortunately the fatigued aviator is often the least able to diagnose his condition. In that instance, the commanding officer, ops officer, safety officer or flight surgeon must remove the aviator from the flight schedule. ◀

Dr. Alkov is the head of the Behavioral Sciences Branch of the Naval Safety Center.

Survival

from an Exchange Viewpoint

by Cdr. Alan Brooks, RN

The Proof of the Pudding

Cdr. Alan Brooks, RN, is one of only a handful of people to have experienced both ejection from a fast jet and a sea ditching in a helicopter. The latter occurred during my time at Portland as SURVO. I remember greeting him on the flight line as he was delivered safely back to the base by the SAR. I was anxious for my friend's well-being, but I also wanted to make sure my equipment had worked!

Whenever we meet, he reminds me of how impressed he was with the after-sales service, and how grateful he was for the drills he had done and the equipment that had performed as advertised. He admits that he carried out the actions that saved his life almost without thinking.

The next year, during the Falklands Campaign, I debriefed a helicopter pilot who had run out of visibility during a VERTREP sortie, became disorientated and flown into the sea. The pilot survived this catastrophic event and managed to go through his drills, ending up in his raft. He was unable, at the time, to recall how he got there.

With the introduction of a new canopy in the Sea Harrier egress system, which is designed to collapse on impact with water, suggestions were made that parachute-dragging drills should be abolished. Early this year a mishap occurred which necessitated the use of such a system. The equipment did not work and Lt. P. Wilson, RN, was most grateful for his ability, learned at drills, to release himself from what was becoming a water-skiing trip.

My job as head of Aviation Life Support Systems (ALSS) at the Naval Safety Center has to rate as one of the best in my career. If you have been lucky enough to experience exchange duty you know that it's not all easy until you break the language barrier. Once acclimatized, however, I found that aviation is basically a very similar business on either side of the Atlantic.

Although basic items of equipment differ, the purpose of saving aircrew is the overriding principle. However, the administration and organization that help achieve the objective in either navy are different.

Because of our projected theater of war during the past 40 years, the Royal Navy views survival in a cold maritime environment very seriously. Lessons learned during the Atlantic convoys of World War II still hold today and the techniques also apply to the modern aviator in the water after ejecting or ditching. Here's how we train our aviators to survive.

★ Organization

SURVO. Each air station and aircraft carrier has an Aircrew Survival Officer (SURVO), responsible to the AEO (AIMD O in the U.S. Navy) for engineering standards and practices within his section, which would equate to the paraloft within an U.S. Navy AIMD. The SURVO is also responsible to Commander Air (Ops O) for running aircrew drills, ensuring that all aircrew flying from the unit, including any air-wing element, are current. Survival equipment maintainers (SEs), although assigned to squadrons, work in AIMD under the direct command of the SURVO in a manpower pooling system.

As well as maintaining flight gear for all squadrons, SEs run the Drills Section, which is normally the busiest shop in town.

Squadron SURVO. Each squadron has a designated SURVO, normally a young pilot who has acquired the job as a collateral duty. He ensures that drills are recorded in individual flight logs and the squadron SURVOs Register, documents that are scrutinized and signed monthly by the squadron CO, quarterly by Commander Air and yearly by the captain of the unit. Duplication of the records makes it unlikely that a disinclined individual may escape some of the more unpopular drills. The squadron SURVO is also responsible for teaching aviators how to use and care for personal equipment.

Individuals. Each individual is responsible for the safe stowage and daily inspection of his flight gear and checking for problems such as cracked helmets, scratched visors, ripped flight suits, immersion suits that have been contaminated by oil, unlubricated zippers and dirty seals. The most important check is that all gear is properly stowed after use.

★ Drills

Aircrew Survival Course (Once only.) Completed after officer training and before starting flight training. Failure results in removal from flight status. The course begins with a two-day period of classroom instruction on survival, and escaping and evading an enemy on the ground, as well as the basics of conduct in the event of capture. Students are taught the fundamental principles of survival in order of priority: protection, location, water and food.

For the practical part of the course, students are clothed and issued with what they might reasonably be expected to have with them—except for firearms—in the event of a grounding in hostile territory. Teams are taken to a sparsely populated area of England where the course begins with a swim—fully clothed—to dinghies moored in a quarry. Once settled, they are left to sit out a period of about 15 hours.

For the next few days, they undergo a prolonged walk and map-reading exercise without food or shelter; basic necessities are checked by instructors at each rendezvous before setting off for another grid reference. Contrived hinderances are introduced to make progress more difficult, the most common being a simulated broken leg—achieved by taking away the boots of a team member—which forces the team to carry the crewman on an improvised stretcher. The supervising staff uses foolproof methods of detecting any cheating.

The teams are eventually guided to an area where they settle in for several days building shelters, animal traps and basic implements which would be required for a protracted period of survival. As the exercise area is inhabited by only wild ponies and deer, neither of which are permitted to be harmed, students receive a little fresh meat, and their first hot meal in days if they are able to light a fire.

During the last 12 hours of the course each student gets the chance over a two-hour period to practice conduct-after-capture techniques. Given the amount of physical exertion and deprivation over the preceding days, this can be a most revealing and valuable assessment of a person's character.

Wet and Dry Dinghy Drill. (Semiannual.) Consists of a one-hour class detailing the working and contents of the life preserver and dinghy pack. Afterward, the class members don drill equipment and enter the swimming pool for the practical lesson. Selected participants are blindfolded; others have an arm strapped to their sides to simulate injury. All have to successfully inflate their equipment and board dinghies. Some equipment will have built-in inflation defects requiring oral inflation.

The object of this exercise is to build confidence and familiarity with the equipment. The drill staff are experienced enough to know when a candidate may be having too many problems. In such cases, any designed problems are removed to permit maximum benefit from the exercise.

Sea Drills. (Every two years.) To add realism to the lessons taught in the above drills, the candidates spend half an hour each in a dinghy and multi-seat life raft. This demonstrates how difficult boarding can be in the calmest of seas and how cold water quickly makes your fingers numb, making the simplest tasks difficult. The motion in such small dinghies can induce sea sickness in the most seasoned sailors, who become rapidly dehydrated by vomiting, a good reminder to take the anti-sea sickness tablets provided in our kit.

On completion of the exercises the candidates are winched out of the sea by an SAR aircraft.

Dunker. (Every two years for helicopter and every four years for fixed-wing aircrew.) Drills are done in daylight and darkness.

Parachute Dragging Drill (Wet). (Every six months.) Done in the swimming pool.

Combat Survival Lectures. (Periodicity: every two years.) Most squadrons have an aircrewman Combat Survival Instructor (CSI), a qualification earned after attending a course with the SAS. The CSI gives lectures on escape-and-evasion and conduct after capture. Practical exercises are conducted during the winter months when aircrew are taken, without warning, from briefings and placed into a combat survival situation. Individuals are required to avoid capture over difficult terrain while being stalked by a military unit and, when available, tracker dogs and helicopter crews using NVGs. ◄

LCdr. Edwards joined the Royal Navy in 1967 as an aircraft radio mechanic. He volunteered in 1972 for aircrew and completed four tours of flying duty. After commissioning, he has held various aviation assignments, including Aircrew Survival Officer at RNAS Portland, and in HMS *Hermes* during the Falklands War. Other duties have included operations officer of an ASW squadron, aviation advisor to the Indian Navy during the sale of HMS *Hermes*, FDO of HMS *Illustrious* and training officer at the RN School of Aircraft Handling.

Too Many C

By Lt. Brian Craddock

A short time later, both aircraft disappeared from radar.

A little over a year ago, a midair collision between two P-3 aircraft caused the loss of more lives than any recent mishap in naval aviation. As happens so many times in so many mishaps, a chain of usually benign circumstances combined to kill aviators who were in the wrong place at the wrong time.

Early one afternoon, the crew of Eagle 201 reported for preflight and brief for an exercise coordinated operations mission. The flight was scheduled with an on-station period of eight hours. Eagle 201 had previous gripes on both the autopilot and on-top-position indicator (OTPI). Other minor equipment discrepancies were noted during preflight. None were considered downing gripes and the crew accepted the aircraft. The crew of Eagle 205, the scheduled relief aircraft, briefed, preflighted and launched shortly after midnight.

As 205 neared the op area, numerous complications came into play. With a report from 201, relayed through FACSFAC, 205 determined that on-station weather was "scattered clouds from 2,000 to 6,000 feet with isolated rain showers." Communications with 201 were erratic as 201 tried to localize and prosecute a tenuous contact off a recently deployed sonobuoy pattern. There was also an airborne helo from one of the exercise small-

uestions

PHC Arnold A. Clemons

boys working the problem. The three aircraft had to coordinate altitude separation in a small operating area.

On board 201, equipment malfunctions were compounding an already intense situation. Eventually, 205 established UHF safety-of-flight comms, instead of VHF as prescribed in the brief. (UHF was to be used for mission communications only.) Eagle 205 was cleared to descend to 3,500 feet. Eagle 201 remained at 2,500 ft. A short time later, both aircraft disappeared from radar. Crew members aboard one of the exercise ships, located more than 10 miles from the collision point, reported an airborne explosion.

Radar tapes and wreckage analysis revealed that 201, which had displayed altitude deviations of plus or minus 200 feet throughout the flight, had climbed into the relieving aircraft.

The collision occurred within two miles of the best buoy in contact. Eagle 201's equipment problems degraded the crew's performance throughout the flight. Recovered mission tapes indicate that the reported weather observation was optimistic; weather had been marginal most of the flight. Finally, the crew of 201 had been on duty for almost 13 hours and airborne more than nine. Voice analysis of mission and ATC tapes also showed that 201's PPC had been in one of the pilot seats for more than seven hours.

What caused this mishap? The pilots of Eagle 201 failed to maintain altitude and the crews of both aircraft failed to see and avoid each other. These are the absolute factors. The mishap investigation dealt with the facts, but the facts are only the root of this mishap. How the individual factors interacted and compounded provide the answers.

Take an inexperienced crew, give them an aircraft with essential mission equipment degraded, throw in bad weather and a demanding, extremely long night mission and the stage is set for disaster.

Could it ever happen again? Can we prevent it? Don't some of these factors play a part in every mission? In spite of problems like these, P-3s have been doing business successfully for a long time. The circumstances of this mishap, although uncommon, were not unique and could be repeated. There were at least two problem areas which could have been changed to break the mishap chain.

The investigators noted a lack of standardized turnover procedures. No formal training on this topic was provided in the FRS syllabus, nor was there any community-wide tactical doctrine. Basically, turnover techniques evolved from previous lessons learned through implementation and experience. These were passed down from pilot to pilot. Although some local, site-specific instructions did exist, they were anything but uniform.

Flight hours are dwindling and with them, flight experience. The PPC of 201 had less than 1,000 hours total flight time and just over 800 in model. The PPC of 205 had even less. Although fully qualified, by P-3 standards, these PPCs were inexperienced. The 3P, who was in 201's other pilot's seat, probably had not seen many tactical turnovers. Today the average fleet pilot has spent less time in the air than his predecessors. This

inexperience will continue to be the trend.

Crews brief certain turnover procedures before every flight. Voice communication between aircraft usually allows a degree of flexibility and relaxation of these procedures, but it cannot allow the crew to relax. Voice communication does not guarantee safety of flight! Why choose an altitude for turnover which places one or both aircraft in the clouds? Why climb on top of the best buoy in contact, the hottest target for both aircraft? When weather is a factor, why not increase vertical separation? All of these questions could have been addressed by standardized turnover procedures.

The only way to compensate for a reduction in experience is through training and standardization. Concepts and procedures that were learned on station, in the cockpit, now need to be introduced in the FRS with continued emphasis in the fleet.

Lack of experience may have played another role. The crew was relatively unfamiliar with one another. The 2P had been only recently assigned to the crew; the 3P was an add-on for that flight. Coordinated ops are arguably the most difficult of P-3 missions. The PPC, viewing his copilots as unknown commodities, may not have had confidence in their ability. Perhaps he decided to stay in one of the pilot seats more than seven hours to compensate for this lack of experience. He did not employ proper crew rotation to avoid fatigue, especially considering the time of day and lack of an autopilot. The P-3 carries three pilots to prevent this situation. Was he aware of his possible alternatives? Did he discuss them with other, more experienced pilots as he advanced to his PPC qualification?

The other key issues are fatigue and crew rest. The investigation produced a variety of opinions and speculations about fatigue and circadian rhythm. Crew-rest and crew-duty day requirements in the P-3 NATOPS and OPNAVINST 3710.7N were reviewed and deemed adequate if flight crew stick to the intent of the rules. Crew rest must be enforced by operational commands. This must include additional emphasis on what constitutes crew rest.

Crew rest is not using the day prior to a night flight to wash the car, play with the kids or catch up on the "honey do" list. The crew must obtain as much uninterrupted rest as possible during the period prior to a long flight, especially early-morning or late-night flights. It is impossible to write instructions which cover every situation, so all guidance must be flexible and administered with a healthy dose of common sense.

The length of the on-station period was also controversial. It is difficult to make policy statements about on-station time; just how long is too long? The P-3 can remain airborne for more than 12 hours. But there is quite a difference between flying at altitude in transit and operating at low levels in the tactical environment. Historically, ASW on-station periods do not exceed six hours. It is possible that special operations or unusual circumstances could dictate the need for extended on-station periods, but these cases must be considered individually. Routine scheduling of ASW on-station periods greater than six hours should be avoided, especially for training or exercise flights.

Why were these flights scheduled this way? Did Ops question the length of the on station period? Did anyone consider turning the two 12-hour missions into three eight-hour events? Did anyone question aircraft availability or mission capability?

The last opportunity to avert the mishap was on station. Did the PPC or mission commander consider a mission abort because of fatigue?

Every command and mission commander must be flexible and practical enough to evaluate situations to determine if safety of flight is an issue. No one wants to be the one who says they can't hack it. Although the pressure to perform is enormous, no flight or on-station period is critical enough to justify jeopardizing safety of flight during peacetime operations. ◄

Lt. Craddock is the P-3 analyst for the Naval Safety Center.

All Helicopters Hold

By Lt. James Roick

Our long-awaited Med '91 cruise had gone from a port-filled European bonanza to three months of nonstop flying in the Persian Gulf. After a quick stop in scenic Bahrain, we transited to the Red Sea for maritime interdiction force (MIF) ops. With the excitement of Desert Storm behind us, 30 days of MIF operations became pretty routine. We flew support for U. S., Spanish, Greek and French ships taking turns boarding merchants heading in and out of the Gulf of Aqaba. On this particular day we were headed into the port city of Hurghada, Egypt, to drop off some passengers and hopefully pick up mail.

Although unfamiliar with the airfield, we expected the hop to be uneventful after a brief from the previous day's crew. We anticipated a little comm difficulty with the Egyptian tower personnel, but that was no big deal for a couple of cruise veterans. After months of working with a multitude of foreign vessels, we were used to it. The weather was CAVU and 20 miles out we called the tower for clearance. We could understand the controller reasonably well and we continued inbound.

At about five miles out, we could see heavy fixed-wing traffic on final for runway 34, but still couldn't pick out the runway amidst all the sand dunes. Tower cleared us for landing on 31 and as we continued in, we could see the log base at the end of the ramp beyond a row of parked MiG-19s.

Approaching the field boundary from the east, we again received clearance from the tower to cross the duty and land. As we neared midfield, a quick glance to my left showed no conflicting traffic. My HAC at the controls decided not to land at the throat but continue down 31 to avoid the parked aircraft.

Just as we were about to cross the duty the tower came over the radio in a loud, highly agitated voice. As best we could make out, they wanted all helicopters to hold their positions. Since we were the only traffic in sight we broke right and began to orbit just over the tower. A few seconds, later the reason for all the commotion become obvious as we saw an Egyptian MiG rolling out midfield with its chute deployed. It didn't take long to realize we had just had a very close call. The MiG blended in perfectly with the surrounding desert landscape. If we had been a little lower or if we had decided to land at the runway intersection, we might have traded paint with that MiG. We didn't hear the MiG pilot communicate with the tower nor did we see the aircraft during our approach.

Despite being cleared to land three times, we still found ourselves face to face with another aircraft at midfield. The combination of an unfamiliar field and the language barrier should have been a red flag. ◀

Lt. Roick flies with HSL-48.

Ever Bet Your Life

on a RAT?

By Ltjg. John G. Fernandez II

Sure, no problem. The ram air turbine (RAT) always works in the simulator, and even if it doesn't, the standby gyro provides seven to nine minutes to find VMC. These NATOPS notes quickly come to mind to any radio-instrument student in advanced strike training. I found myself IMC, at FL 290, at night next to a most intense thunderstorm (recall that the TA-4J does not have weather radar) with a controller that didn't seem to understand my situation. Suddenly, a lot more came to mind when I was betting my life on a RAT.

It was my first cross-country in the TA-4J. An instructor was looking for a student to go to the northeast and I eagerly jumped at the chance to get out of NAS Chase Field for the weekend.

We looked at the weather and it wasn't the greatest; there was a wall of thunderstorms (with a few holes) from Illinois to Florida. My eagerness was dampened by the hair-on-the-back-of-my-neck feeling as we received our weather brief. My instructor, a former Intruder pilot, mentioned something about the quality of training that I would receive. The weather did meet OPNAV filing criteria. Now if it just held.

As we approached our gas-'n-go location, a monstrous thunderstorm was moving in from the northwest. My planned TACAN penetration was canceled as the IAF was right in the middle of the thunderstorm. Unfortunately, the controller couldn't understand that we didn't want to penetrate the thunderstorm. He kept vectoring us into the thick of it. My instructor took the controls and turned us away from the storm, telling the controller that we had no other option. After we landed, the thunderstorm passed overhead with a lot of rain and hail. (Hail? Hmmm-mm, didn't see any mention of hail in that weather brief.) At first, we thought that we were going to be spending the night, but it appeared that the storm was moving to the east, and if we launched to the north, we would miss it. Off we went.

The weather brief confirmed everything was moving to the east, nearly all the way to our destination. We planned to be above it all the way. As we launched into the night, the controller was busy trying to get the arrivals around the thunderstorm that passed over the field prior to our launch. The controller still did not understand that we would not penetrate the thunderstorm and he kept steering us east, into the storm.

Once again, my instructor took the controls and turned us north, telling the controller that we had no choice.

We continued north climbing to 290 where we still found ourselves IMC. My IP requested, and we were cleared, to FL 330. I added power to climb. It got real dark—the kind of dark you read about in Stephen King novels. My IP had the RAT out in no time, and I broke out the PCL to review all the procedures. Not a particularly hairy situation. Everything works fine on the RAT, except for a few non-critical items—radalt, t-storm lights, fuel-boost pump, and exterior lights. Well, I used to consider them non-critical items.

Center radioed our temporary transponder loss. We told them of our situation and declared an emergency.

In the cramped cockpit of the A-4, several emergency handles are positioned close together. Could you find the *right* handle quickly—in the dark?

We began to hunt for an emergency airfield and chose NAS Oceana. As per NATOPS, we descended below FL 250 to FL 190 where we hoped to find VMC. Unfortunately, we were still IMC with no idea on the location of the thunder bumpers. We discussed our arrival procedures, what we had available to us, and planned on picking up a GCA for a trap, following wing SOP.

We began to discuss our alternatives if the RAT failed. It boiled down to "prepare to eject." We didn't know the height of the en-route terrain, so how low would we descend to try to find VMC in the seven to nine minutes we had on the standby gyro? With no airfield within 100 miles, we had no emergency safe-altitude information. Fortunately, the RAT kept us going for 55 minutes. The thunderstorms that were supposed to be to the "east of our route" did not develop where forecast and we broke out at 4,000 feet with Oceana in sight. At the end of the trap, the generator came back on line and we lit up like a Christmas tree.

During the debrief, my IP and I discussed the event in greater detail to better prepare this fledgling birdman should a similar event occur later in my career. When I asked him how he found the RAT handle so fast, he said that he just grabbed it and pulled. "Not the little round handle?" I asked, the little round one being the closely-positioned Canopy Jettison Handle.

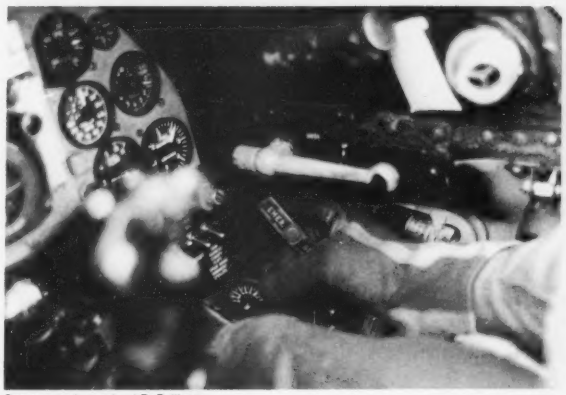
"Didn't even think to check," he replied.

Yes, he has hundreds of hours in the TA-4J. After I re-read the warning about the incapacitation of the rear pilot from windblast (that's freezing windblast) and such, I'm sure that I would have had to have been chipped out of the rear cockpit if my IP grabbed the wrong handle.

One item that we didn't brief in flight, but debriefed later, was the bypass/normal switch selection if the RAT failed (i.e. bypass the RAT to see if the generator had come back on line). We didn't discuss such a simple solution to a likely ejection possibility until we were safe on deck.

There's more. Our trusty steed was fixed and we departed the next day for homeplate. Only this time it was CAVU and we had a good generator, or so we thought. Same problem, same altitude. Power up and "blink." This time, my IP held up his fist to wait before tossing out the RAT. After it was successfully deployed, we continued to update our plan should the RAT fail (we applied a little I-fly-by-roads).

On final approach, we checked the bypass/normal switch and found that the generator had come back on line. After a successful repair, we launched the next day for an uneventful trip home.



Sequence photos by J.F. Cullinan

A number of things occurred that weekend which I thought about when I got home. This was a fairly common emergency. The RAT performed as advertised, but as I reconstructed the flight, more questions and possible outcomes came to mind. Writing about it has been an even greater learning experience. The learning curve was steep that weekend and could not have been duplicated in the sterile simulator environment. What-ifs, unforecast weather (hail) and a questionable generator made for a spicy weekend. Following NATOPS and making sound decisions kept the spice to a minimum. ◀

Ltjg. Fernandez was a student with VT-24 at the time of this story. He is currently assigned to VFA-125.

The Night the Lights Went in the Radios

By Lt. Daniel J. Johnston

It was a typical evening in southern Californian waters— beautiful sunset, calm seas, and a low broken layer to make the upcoming night trap even darker. Man-up, start-up, and the cat shot all were normal and we were off on another SSC mission—that is, until we got to about seven miles on the climb-out and my pilot started complaining about funny lines on the ADI.

About that time I switched to Strike to get our checks, and when I keyed the mike we got more problems than lines on the ADI. Both radios went blank, all lights out, no power! I remembered all the times I had heard people say "We've got two radios; we'll never go NORDO." A fat lot they knew. The sun was gone and we couldn't talk to anyone.

Once the initial shock wore off we headed for 10,000 feet and the overhead tanker. On the way, I broke out my PRC-90, thankful I had checked the battery before we launched. I put the earpiece on it, shoved it under my helmet and gave Strike a call on guard. We were still about 20 miles from the ship, but Strike answered on the first try.

We told them about our problem and that we planned to join on the tanker and let him bring us down for this recovery. They thought that was a fine idea so we began dumping gas and made our rendezvous.

Unfortunately, the off-going tanker had already departed so we got the on-coming one. By now, it was dark, and so was the ADI. As we joined on the tanker he began talking to me on my PRC-90. Strike had told them about our problem, and they asked if we had any other malfunctions. I told them our ADI was out and other than having no radios we were great. We descended to the downwind heading with him as he relayed all the calls from Marshal. He took us through the standard NORDO dirty-up procedures using flashlights and backup calls on my survival radio. I asked my pilot if he thought he could get his radio and put the earpiece in his ear, but he said he was too busy and he didn't need it.

As we rolled onto a 10-mile final at 1200 feet, Approach came up on guard. At six miles I began to realize how unfortunate we were to have joined on the oncoming tanker instead of the off-going tanker. When he slowed to on-speed, we were still at 148 knots. We were right in the middle of the scud layer though, so we had to stay on his wing.

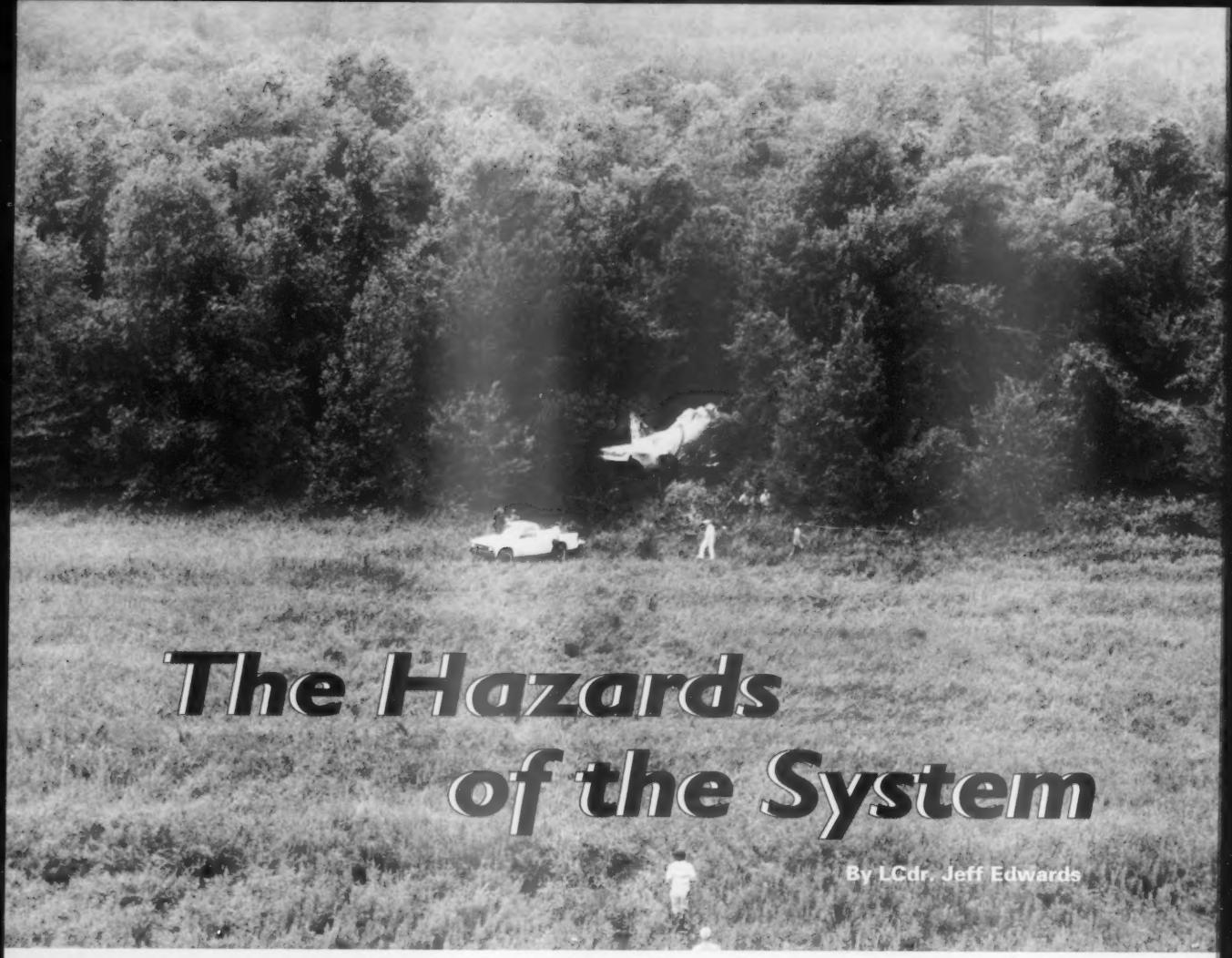
Both radios went blank, all lights out, no power!

We pushed over at three miles and finally broke out of the goo at a mile-and-a-half and 600 feet. As the tanker broke off and my pilot transitioned to flying the ball and dropped 20 knots to get on speed, the LSOs started talking to us. More correctly, they started talking to me because my pilot hadn't taken the time to get his radio out. I was sure that no matter how fast or far I moved the slew stick it would not help us get aboard. I relayed as many of the LSOs' calls as I could, and still managed to call a few VSIs in between. Somehow we managed to get aboard, very thankful we didn't have to do that again.

All in all, not a bad night. We got an OK out of the pass and we were around to eat pizza at midrats. It could have been better though. If I had it to do over again I would have tried harder to get an aircraft closer to our own gross weight to lead us down. I would have also insisted my pilot rig his radio so he could hear critical calls. ◀

Lt. Johnston is a BN with VA-145.

PH1 Michael D.P. Flynn



The Hazards of the System

By LCdr. Jeff Edwards

Last July, a Huey's tail-rotor drive system failed, forcing the crew to autorotate into some trees. It was a Class A mishap, which I investigated: two fatalities and total loss of the aircraft. A similar incident had occurred less than six weeks earlier, but in that case, the crew was able to make a precautionary landing on a golf course. That squadron issued a severe hazard report detailing the incident. However, no action was taken by anyone in the chain of command or cognizant activity for the failed components. In fact, the first endorsement for the severe hazard report wasn't issued until after the second Huey crashed.

The failed components for the first incident didn't show up at a Naval Aviation Depot for an engineering investigation until the day I walked in to the same depot with the parts from the Class A mishap. It was chilling to look at both components and see the similarities in the failed bearings – and to realize the information that could have saved two lives was moving too slowly through the system.

Sluggish alerts and misperceived hazards are only part of the problem, of course. Some hazards we hear about, but don't act on. Others we never hear about at all.

At the Aviation Safety Officer course at Monterey, safety officers learn that there is a mishap pyramid. For every Class A mishap, there should be several Class B mishaps, more Class C mishaps and lots of near misses (which should, theoretically, trigger hazard reports). However, if you review the CY 1991 stats, you find that Class A mishaps outnumber Class Bs 3 to 1. How is that? It's hard to cover up a smoking hole and hide a dead body – but it's easy to downgrade a Class B or C right out of the reporting system. And although Navy squadrons generate about 2,500 hazard reports a year, it's even easier to not report the hazards at all. As one commanding officer explained to me, "Submitting a HAZREP is like putting

yourself on report."

Of course there are certain drawbacks to the look-good-at-any-price mentality. By not reporting hazards we deprive the rest of the Navy of the benefit of our experience. More importantly, we fail to eliminate the hazards.

Several mishaps this year were the result of a failure of the Naval Aviation Safety Program to eliminate hazards. In some cases squadrons didn't issue hazard reports identifying hazards. In other cases the chain of command failed to act rapidly enough on an identified hazard.

Early in the year an F/A-18 crashed following a total hydraulic failure; the pilot ejected and suffered flail injuries. Recovery of key hydraulic components pinpointed the exact failure and several additional weaknesses in the hydraulic system. These components were previously identified as needing corrective action based on the recommendations of an earlier mishap board. After the first mishap, the manufacturer recommended inspecting the items within 25 flight hours. No significant action was taken until the second mishap occurred.

Another Class A mishap involved a high-speed ground ejection with one fatality. The parachute didn't open because the parachute arming lanyard failed. During the investigation, we found that a previous ejection had resulted in a similar lanyard failure. In spite of the failure, the aircrew had been able to get a good chute. No harm, no foul – because no one was injured, the squadron elected not to submit a hazard report. In this case the hazard came right back to haunt the squadron.

In each of these cases, the safety program failed. People died and aircraft were destroyed. In two cases hazards were identified, but action was not taken in time to change history. In the third case a hazard was identified, but not reported.

What should you do? First, you can help by identifying hazards and working to eliminate them. Submit hazard reports on hazards you see. If you have a mishap, report it – don't cover it up. Second, follow up on hazards that affect your aircraft, equipment or community. Follow up on engineering investigations you request on failed components; parts and exhibits often get lost in the supply system. If it's a critical part, ship it via an overnight delivery service, using "fastest traceable means." Contact the engineer at NADEP responsible for that system to see that he got your component, and find out from him first hand the status of your investigation. Don't wait for the message paperwork. Call your class desk at NAVAIR or the Safety Center to see what's being done about the hazard. Make sure the hand-off doesn't get fumbled. ◄

LCdr. Edwards is a mishap investigator at the Naval Safety Center.

UH-1N tail rotor drive shaft coupling. Heat from failed bearing boiled cadmium plating off coupling (above) and melted aluminum insert assembly leading to loss of tail rotor drive. This coupling and other components found in crash site (right) looked identical to one from UH-1N that made precautionary landing six weeks prior.

BRAVO ZULU

Left to right: Capt. Ronald Selvy, USMC; Cpl. Michael Claussen, USMC; Capt. Martin Wright, USMC; LCpl. Mark Dickerson, USMC

Capt. Martin Wright, USMC
Capt. Ronald Selvy, USMC
Cpl. Michael Claussen, USMC
LCpl. Mark Dickerson, USMC
HMM-161 (REIN)

During retrograde operations for Valiant Usher 93-1, Greyhawk 22 made multiple troop-transport flights from Lancelin Training Area, western Australia, to ships of the amphibious readiness group (ARG).

Carrying 17 Marines to USS *Ogden* (LPD 5), the CH-53E crew prepared for landing. Capt. Wright (HAC) called for landing checks. With three down-and-locked, he began his approach. When the aircraft was 50 feet from the deck edge, the crew heard a loud bang, followed by the Air Boss calling for a waveoff. The Boss and Cpl. Claussen (crew chief) saw the Sea Stallion's nose gear leave the helicopter and fall into the water. Capt. Wright waved off while Capt. Selvy (copilot) scanned the instruments. The crew declared an emergency and headed for their mother ship, USS *Tarawa* (LHA 1). The two pilots discussed recovery procedures with no nose gear. They decided to divert ashore if the sea state placed the ship out of recovery limits.

Cpl. Claussen and LCpl. Dickerson (first mechanic), prepared the passengers and cabin for recovery. Cpl. Claussen also monitored aircraft systems and discussed post-landing procedures with the pilots.

Tarawa began preparing for recovery. The ship took a course that would minimize pitch and roll while the deck crew cleared the aft flight deck. A platform to support the aircraft's nose was prepared by placing a padded crash pallet on a flat-surfaced aircraft crash dolly. The assembly was cargo-strapped to the flight deck between spots 7 and 8, on the tramway. After reviewing procedures from approach to shutdown with the pilots, Tower cleared the helicopter to land.

Capt. Wright flew an approach to the platform while Cpl. Claussen gave deck position calls and Capt. Selvy called airspeed, altitude and system status. The HAC centered the nosewheel well on the platform, despite a pitch-and-roll rate of 2-3 degrees and a 7-10-knot crosswind. The deck crew chained the aircraft in position and the crew shut down without using the rotor brake.

The ship's crew recovered the nosegear; the oleo shock strut's internal attachment pins had failed. The aircraft had not sustained other damage and was back in service the next day.◀

LCdr. Pat Lorge
Lt. Sean Overton
VF-14

After launching from USS *John F. Kennedy* (CV 67) in the eastern Med, Camelot 110 accelerated to 450 knots and climbed to 8,000 feet for an overhead rendezvous. As they decelerated in the climb to 300 knots, LCdr. Lorge (pilot) and Lt. Overton (RIO) noticed that both the wingsweep warning and advisory lights were illuminated. The wingsweep indicator and a visual inspection confirmed that the F-14A's wings were stuck at 58 degrees aft.

LCdr. Lorge slowly moved the emergency wingsweep handle forward, but the wings didn't move. The crew tried unsuccessfully several times to reset the wingsweep advisory and warning lights and to try to move the wings forward.

Following a brief discussion with the squadron rep, the crew decided to divert; carrier landings with the swings swept aft beyond 40 degrees are prohibited. The nearest divert with arresting gear was out of range for the Tomcat, and the aircraft went toward Cairo International Airport, which had a 13,000-foot runway, but no arresting gear. Neither crewman knew the field and no one knew how the Egyptian controllers would coordinate the emergency.

LCdr. Lorge and Lt. Overton checked the flight characteristics of their aircraft in the landing configuration and determined that their approach speed would be 190 knots. Lt. Overton had coordinated with the controllers, while LCdr. Lorge prepared for a straight-in approach.

Approximately 10 miles from the field, the pilot noticed that the flight-side hydraulic pressure had dropped to 2,000 psi. During the landing rollout, it dropped to zero, but with the dual hydraulic system of the F-14, the landing proceeded uneventfully.

Troubleshooting revealed that the right wingsweep-drive motor had

failed. A hydraulic line off the bidirectional-flow regulator valve had also failed, causing the flight-side hydraulic leak and failure. Although numerous wingsweep-drive-motor failures have been documented in the F-14 community, current NATOPS procedures only address electrical aft-wingsweep failures. NATOPS does not specifically discuss mechanical failures.

If the handle for emergency wingsweep had been rapidly moved forward or aft of the 58-degree position, this emergency could have worsened by the wings moving further aft or into an asymmetric sweep, if the wingsweep-synchronizing shaft had failed.

VF-14 submitted a hazard report recommending incorporating emergency procedures in the F-14 NATOPS covering mechanical aft-wingsweep failure. VF-213 submitted these procedures in response to an earlier failure in one of their F-14's wingsweep-drive motor. ◄

PHAN Dan Rich

Left to right: AW1 Reid Whitacre, AW2 Juan Quintana, Lt. Michael Barnovitz, Lt. Todd Flannery

Left to right: Lt. Sean Overton, LCdr. Pat Lorge

Lt. Michael Barnovitz
Lt. Todd Flannery
AW1 Reid Whitacre
AW2 Juan Quintana
HS-14

Lightning 611 was 30 minutes into a night plane-guard mission off USS *Ranger* (CV 61) in the North Arabian Gulf when Lt. Barnovitz (HAC) smelled burning insulation. He told his crewmen to investigate. As the two crewmen unstrapped to move around the cabin, the SH-3H suddenly lost electrical power, all internal and external communications, internal and external lighting, most flight-performance instruments, all engine- and gearbox-monitoring instruments, and all flight-control stabilization equipment.

Severely hampered by the lack of a horizon, Lt. Flannery (copilot), who had the controls, immediately began a gradual climb. When stable and at altitude, Lt. Barnovitz told his crew to begin troubleshooting while he took control and turned toward the carrier.

The crew couldn't restore power, and the HAC directed AW2 Quintana (first crewman) to fire pencil flares toward the water and drop smokes abeam the ship to try to alert other aircraft and the ship of their predicament. AW1 Whitacre (second crewman) broke out his PRC-90 and broadcast a mayday. Ranger's CO put all fixed-wing traffic into an overhead holding pattern.

Now cleared for landing, Lt. Barnovitz put the Sea King in a low, ASE-off hover over the deck while Lt. Flannery and AW1 Whitacre executed the procedures for emergency extension of the landing gear. With the gear down-and-locked, Lt. Barnovitz landed and made an emergency shutdown.

The battery had gone into thermal runaway, and was in danger of exploding. It had damaged both transformer-rectifiers, shorting out DC power and most of the AC power. ◄

That's Why It's Called *Survival Gear!*

By LCdr. Jeff Edwards

An S-3 crew ejected when their Viking shed its tail on a test hop over the Chesapeake Bay. During the out-of-control ejection, the pilot hit something in the cockpit on his way up the rails. The blow shattered his shoulder and knocked him out cold. Being an S-3 bubba, he wasn't wearing a mask, his visor was up, his gloves were off and he wasn't wearing a poopie suit. He was, however, wearing his shades.

The ejection placed his head and shoulders directly below the COTAC's ejection seat where the rocket gases severely burned his face and hands. The blast from the seat was so hot it charred the pilot's flight suit and the leather roll around the helmet. He was also wearing a cotton-poly t-shirt, which melted to his chest. Fate smiled on this unconscious, horribly burned fellow because the FLU-8 inflated his vest and the SEAWARS disconnected him from the chute.

Within five minutes, officers from Maryland's Department of Natural Resources in a Boston Whaler hauled the pilot out of the water and got him to a hospital burn unit in Baltimore. Two words describe this part of the mishap: dumb luck.

I used to be a macho jet jock flying around the skies in my fun machine. Safety was for someone else. I wore my lucky flight suit and self-adorned helmet. In the "old days," the Air Boss never made you wear your oxygen mask on deck. The skipper was so macho he never wore a G-suit even on the days we went to the target range and practiced pop-ups. It was cool to wear Ray Bans instead of your visor, and who wore gloves around the boat? Poopie suits? Heck, 65-degree water isn't that bad. If it wasn't completely comfortable or cool, we didn't wear it.

I imagine that sort of thinking still exists today. After all, I've only been out of the fleet for a little more than a year. I'm now an aircraft mishap investigator at the Naval Safety Center. What a great job! Flying all over the world to investigate Navy-Marine Corps aircraft mishaps. But just one year and 10 Class A investigations have taught me how wrong my thinking about flight gear and survival equipment really was.

An F/A-18 pilot recently ejected from his crippled aircraft following a total hydraulic failure. He suffered ma-

jor ligament damage to both knees because of windblast flail from the high-speed ejection. He could have reduced his injuries if he had properly worn his leg restraints on his calf below the knee, instead of above the knee. After knee surgery and months of rehabilitative work he is flying again.

I also investigated a particularly tragic mishap involving an F/A-18 that was returning to an overseas airfield. Almost an hour after in-flight refueling, the aircraft crashed approximately 35 miles northeast of the field. The crew was preparing for a precautionary single-engine approach and landing when the aircraft departed and crashed into the jungle below. The Weapons System Operator ejected the crew. The pilot was recovered with minor cuts and bruises by a SAR helicopter. The WSO's body was recovered days later by Malaysian jungle police. He had not been strapped to his parachute when he ejected.

I investigated an HH-1N that crashed into a glacier during a whiteout. The Huey struck the top of the glacier and then slid off it, plummeting more than 100 feet to rocks below. The HAC and copilot survived. The HAC had minor injuries and shock but the copilot had a broken leg and dislocated hip.

The HAC wandered around the crash site looking for survivors. He discarded his gloves along the way. Shock will do that to you. He found the copilot and wrapped a sleeping bag around him. Since the HAC and copilot elected not to wear their survival vests because they were uncomfortable, their PRC-90s were lost for several hours. Eventually, the dazed and hypothermic HAC found his crew bag with survival vest and radio on the side of the glacier.

Unfortunately, the dazed HAC did not turn on his radio until he heard a helo close by. He didn't know that a C-130 was orbiting in the area trying to get a fix on them. The squadron and base had launched a heroic rescue operation at the height of the storm, but were unable to locate the crew until the HAC found his radio and turned it on and started broadcasting. Because these aviators didn't wear their crew vests with the PRC-90s, and didn't take advantage of the survival gear in the crew bags, the rescue was delayed by hours and both survivors of this mishap suffered extreme hypothermia and frostbite.

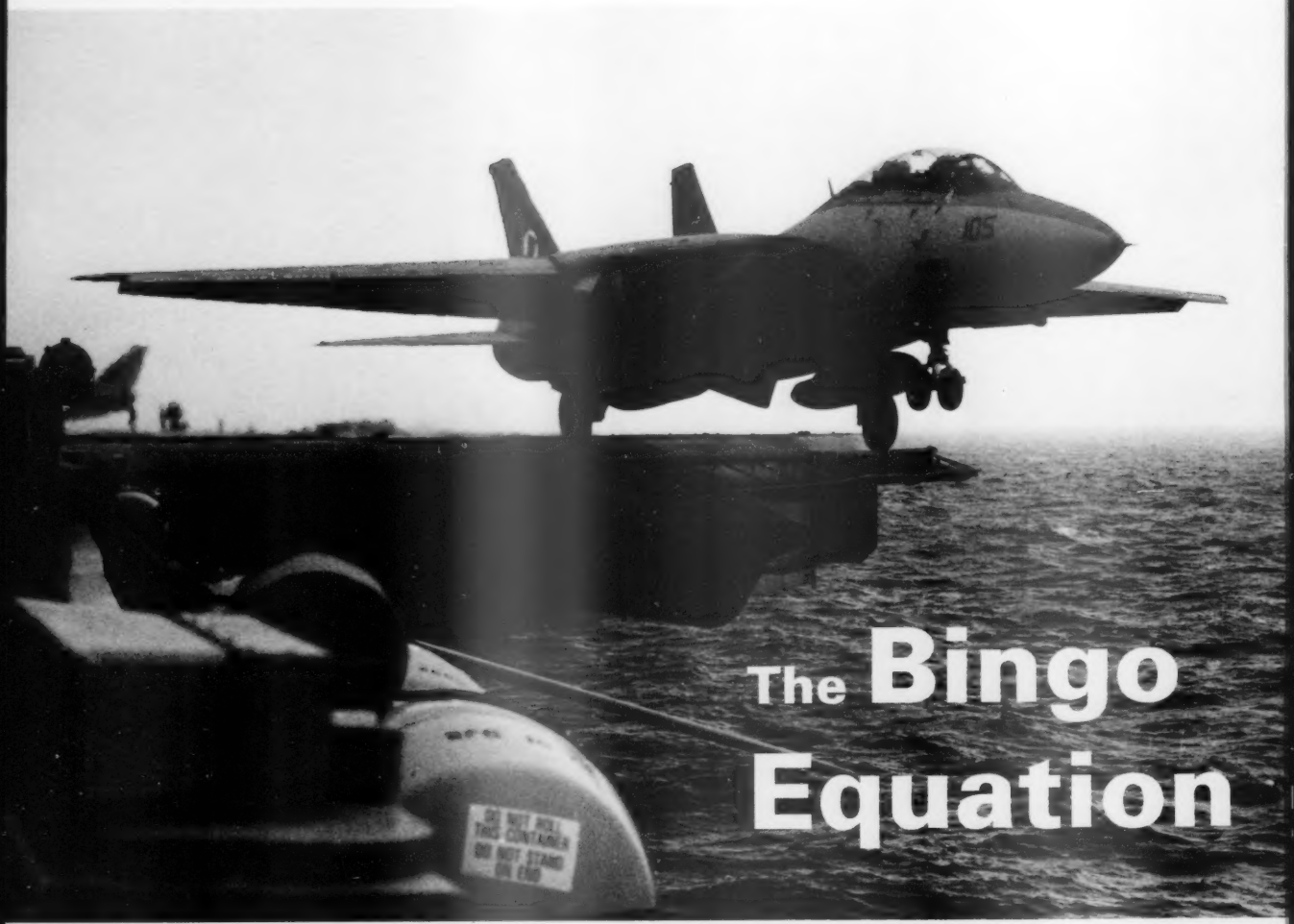
We have survival equipment to survive on the ground or in the water until rescue; that's why its called survival gear. I found out this year that if you don't use it, and you ignore your training, you probably won't survive. ◄

LCdr. Edwards is an A-6 BN. He is currently assigned to the Naval Safety Center as a mishap investigator.

LCdr. T.B. Surbridge

If you fly off the carrier long enough, it will happen to you. "It" usually goes something like this: trouble getting aboard, low-fuel state, pucker-meter pegged, problems at the tanker, and an eventual divert ashore. While bingo flights are not uncommon, they are never routine. The bingo decision can also create a dilemma for the flight crew.

LCdr. Tom Prochilo



The Bingo Equation

Who really makes the bingo decision? Is a bingo automatic once the predetermined fuel state is reached? When can a pilot use his authority as pilot in command to take matters into his own hands? Does a pilot have the authority to countermand an order given by a senior if the pilot feels the safety of his aircraft is in jeopardy?

A few years ago, an F-14 crew had problems on a night AIC hop, during simulated blue-water ops. Both pilot and RIO were first-tour aviators; the pilot was on his first cruise, the RIO on his second. They had approximately 300 hours and 900 hours in the Tomcat, respectively.

The recovery was in EMCON so the ship was monitoring the recovery with air-surveillance radar, but was not providing information to aircrew. The RIO had a contact at 45 miles and confirmed with the orbiting E-2 that it was the carrier. Rain and lightning in the area did not make finding the ship easy and the Tomcat crew overflew the ship. The E-2 told them to continue for another four miles. Meanwhile, the F-14's wingman lost sight and separated, leaving the lead fighter to press on.

Finally, an airborne S-3 told the ship that the weather was too bad to continue EMCON and recommended the ship "turn your gear on." The carrier complied, activating its TACAN.

Somewhat disconcerted, the pilot settled into his approach with a fuel state of 5.3, and good needles. However, he had gone much farther than that comfortable state would indicate; 35 minutes had elapsed between the push to the ball call. The pilot began his approach high and to the left, and after one power call from the LSO, was waved off.

As CATCC came out of EMCON, the F-14 crew seemed confused as to whether they were still in EMCON or a normal case III recovery. The wing rep recommended that if a second pass was unsuccessful, the F-14 tank from an orbiting A-6.

The Tomcat took a second waveoff and headed for the tanker. However, after rendezvous and plug were accomplished, the tanker was sour and the Tomcat and Intruder turned back toward the ship to rendezvous with an A-7 tanker, which had just launched. By this time, the F-14's fuel state was 0.7.

As the Tomcat struggled toward the Corsair tanker, its right engine flamed out, followed shortly by the loss of the left engine. Checking their instruments with their flashlights, the crew ejected at 10,000 feet. They were rescued by two SAR H-3s and returned to the carrier.

The mishap investigation discussed several contributing factors, including the Tomcat pilot's low instrument grades, and poor performance around the carrier. The command was addressing these inadequacies by crewing the junior pilot with experienced RIOs. The two passes—especially the second where the F-14 descended *after* the waveoff, causing concern on the flight deck—indicated the pilot's problems.

While the fighter crew was having its troubles, the ship didn't help by delaying the launch of the A-7 tanker after the A-6 went sour, particularly where this event was the first night, blue-water evolution during advanced phase training. There was a divert 258 miles away, but with a state of 5.3 on the ball, the crew would have had to decide immediately to head for the divert instead of trying to get aboard—at best, a close, *tough* call.

Ultimately, the crew had to take a swim. The RIO later said that he thought that his pilot was under too much stress and couldn't make the trap. They had both decided to bingo, regardless of orders from the ship. It's not clear at what point the crew thought they would bingo. Certainly by the time they were climbing toward the A-7 tanker, it was too late.

Although a bingo situation can be a grey area, OPNAV instructions are very specific:

"The pilot in command is responsible for the safe, orderly flight of the aircraft and the well-being of the crew." Just as specific is every naval officer's responsibility to obey the lawful orders of his seniors. So what's a JO to do when faced with a decision that will violate one rule or the other?

In a perfect world, the pilot would never be put in a situation where he had to make that choice. CAG, coordinating with the squadron CO and the ship's captain, would keep a close eye on an aircraft with a low-fuel state and have a plan of action ready for any eventuality.

If a bingo situation appeared possible, the embarked admiral would be informed in sufficient time to get his input on "the big picture." Everyone would be on the same wavelength concerning standard ship and air wing policy. For example, at bingo plus one, the aircraft hits the tanker. If the pilot can't get fuel by the time he reaches bingo state, he's off to the divert field immediately. The ship coordinates with the divert field and assists the diverting crew. Unfortunately, night carrier ops are anything but predictable. Tankers go sour. Tailhooks skip wires. Weather gets bad. Aircraft and flight-deck emergencies arise. Communications break down.

Thus, there are no absolutes, no inviolable rules that can be set forth about bingos; only guidelines and philosophy. Here are some thoughts. No one knows better than the pilot-in-command what his fuel state is, what his capabilities are and what condition his aircraft is in. It is

LCdr. Tom Prochilo

up to the pilot to aggressively and assertively relay information to the ship that may be relevant in a bingo or tanking situation, and then take action he feels necessary to ensure the safety of his aircraft.

The pilot in command must consider the quality of the divert field in his decision. Does it have good navaids that are compatible with his aircraft? Is it manned by English-speaking controllers? Is the runway always lit at night? Will the field be difficult to find?

Tanking en route to a divert field burns more fuel than flying the bingo profile. It should be done only if the aircraft is above bingo fuel. There can be circumstances where the safety of an individual aircraft is not the most important consideration. In a wartime situation, for example, the absence of one aircraft, even for a day, might jeopardize the safety of the ship and air wing. This kind of decision has to come from the embarked heavies, and the pilot who chooses to disregard orders from an embarked admiral or ship's CO had better be prepared for the consequences.

An endorsement to a real EA-6B mishap that occurred during a bingo offered some good thoughts:

"It is incumbent upon every pilot in command to know the fuel limitations of his aircraft and to determine when to bingo. If that decision is overridden by higher authority, the pilot in command is relieved of responsibility for that decision. A bingo is no light action for an aircrew to take on its own initiative, but that does not negate the ultimate responsibility of the pilot in command nor prohibit the aircrew from making difficult decisions concerning the safe conduct of the flight."

Flying requires you to make decisions all the time, some of them easy, some of them tough. Don't give up that control. Ultimately, you're the one who rides the silk if the CAG makes the wrong decision. I'd rather have a long green table in front of me than a cold steel table under me. ◄

This article was written by members of the *Approach* staff.

The Pointy End

By Lt. Isaac May

We all get the flight surgeon's brief as we come through the training command. Don't fly with a cold, even if you can valsalva. And you're not in the fleet very long before you meet someone called "Zipper Head." He's the guy who tells the story of excruciating pain while descending out of marshal, the blood trickling down his lip and of how many stitches it took to sew his face back on.

Descending out of the stack doesn't have to be painful, though. There may not be any clues like fresh blood. Your discomfort could be mild, a fullness in your head that doesn't go away. A few days later, you have a little fever, and after a sleepless night, you see the doc.

The x-ray shows an opaque area just beneath the cheekbone. You're now a candidate for sinus treatment. Two weeks of antibiotics and decongestants follow. But, as the weeks roll by and your squadron leaves you behind for Fallon workups, you're stuck at home with a toothache from the infection and no sign of improvement.

Finally, the doc decides that it's beyond his expertise and you willingly seek out a specialist. He gladly tells you that no cancerous tumor is growing in your face; the bad news is that you need a sinus irrigation to free the blockage.

With what seems to be a twinkle in his eye, the specialist explains that there is only a 1 in 10,000 chance that this procedure could sever a nerve and paralyze half your face. The possibility of infection is remote. You've faced worse odds, but your confidence wanes as you sign the paper that releases the Navy from any liability.

And there you are, facing the pointy end of an eight-inch needle about the size of a pencil lead. Suddenly, the flight time doesn't seem that important, but the needle actually goes in pretty smoothly, just under the upper lip. The gum tissue is fairly soft. Soon, however, it meets with resistance. The doc tells you to brace yourself and there's a sickening crunch as the needle pierces the sinus wall.

After the doc uses a syringe to suck out a few lab samples, a corpsman hooks up a tube to pump a saline solution through your face. The corpsman says you owe him a beer for warming it up to a comfortable temperature.

You're med down for a couple of weeks to let the hole in your sinus heal. That's enough time to consider your good fortune of not being a zipper head. ◀

Lt. May flies A-6s with VA-155.

Vulture's Row

Oct. 1, 1992 — An **F/A-18B** from NATC Patuxent River crashed after waveoff on final approach, killing a civilian motorist. The crew ejected.

Oct. 13 — An **HH-1N** from Antarctic Development Squadron 6 crashed during a whiteout on a VMC return flight, killing the crew chief and two passengers.

Oct. 16 — During an ACM engagement near Key West, FL, an **F-14A** from VF-302 departed controlled flight. The crew ejected.

Oct. 20 — A **CH-46E** from HMM-262 crashed at night at MCAS Futenma, Okinawa and was destroyed. No fatalities.

Oct. 28 — An **A-4M** from Navy Fighter Weapons School departed controlled flight during a simulated strike mission and crashed near Yuma, AZ. The pilot ejected.

Nov. 1 — An **F/A-18D** from VMFA(AW)-225 ran off the end of the runway during an aborted takeoff at 29 Palms, CA. The crew ejected.

Nov. 3 — An **EA-6B** from VAQ-129 crashed on takeoff at NAF El Centro, killing three crewmembers.

Nov. 4 — During shipboard ops in the eastern Atlantic, a **CH-53E** from HMM-261 crashed into the water at night. Five fatalities.

Nov. 8 — During day vertrep, a **CH-46D** from HC-11 had total failure of the aft transmission. The aircraft ditched at sea. The crew was recovered.

Nov. 22 — An **F/A-18A** from VFA-97 crashed after a night cat shot aboard USS *Kittyhawk*. The pilot ejected.

Nov. 25 — During a single-engine approach at NAS Kingsville, a student pilot in a **T-2C** from VT-23 ejected when the second engine failed.

Dec. 9 — An **AV-8B** from VMA-214 flamed out at altitude near MCAS Yuma. The pilot ejected.

Dec. 15 — An **F-14A** from VF-33 departed controlled flight during an ACM mission on off the North Carolina coast. Both crew members ejected.

Dec. 17 — An **F-16N** from VF-126 disappeared from Salt Lake Center radar and crashed near Twin Falls, Idaho. The pilot was killed.

Dec. 23 — An **F-14A** from VF-201 departed controlled flight during an ACM engagement with an A-4. The RIO was killed.

Jan. 18, 1993 — An **F-14** from VF-101 was on an FRS ACM syllabus flight at Key West, FL. The aircraft entered a post-stall gyration, nose-low spiral (not a spin). Aircrew ejected.

Jan. 25 — An **F-14A** from VF-24 was on its first pass in the FCLP pattern. NFO command-ejected aircrew as the aircraft rolled through 60 degrees, left wing down. The aircraft crashed in a landfill near NAS Miramar.

(Operational Class A Mishaps as of Feb. 1, 1993)

Idea Contributed by NAS Corpus Christi

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knowing your

Emergency Procedures

UNITED STATES NAVAL SAFETY CENTER